THE MOTOR AGE

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INFORMATION FOR FUTURE BUYERS—III.

CONTINUATION OF EDITORIAL COMMENT ON THE AUTOMOBILE AND THE INDUSTRY—THE STEAM CARRIAGE DESCRIBED AND ITS VARIOUS ADVANTAGES AND DISADVANTAGES POINTED OUT—SPECIAL CONSTRUCTION NECESSITATED

It may not be amiss to repeat that the steam engine is an old friend. During the entire history of invention, there has been found no agency for furnishing power that is as economical or as satisfactory except that windmills and waterwheels, which, utilizing the forces of nature, have been found more economical. We may except the hydrocarbon (gas and gasoline) explosive engines, which will be considered later on, from this statement.

Water is cheaper and can be had almost everywhere and fuel of various kinds can be easily obtained in any community that rises to the dignity of being called a town, as well as from individuals in case of emergency. The only problems that beset the would-be builder of a steam driven vehicle, then, were those of

producing a boiler that would be sufficiently light to avoid the drawbacks of extreme weight which have already been enumerated in considering electric traction, would produce steam quickly enough so that delay in getting the vehicle ready to start would not be a great disadvantage, would require little attention, would

Stanley Trap—American steam vehicle.

be economical of water so that it would be found necessary neither to make frequent stops to replenish the supply or to carry such a load as would give the disadvantage of extreme weight, to provide a fuel that was light in weight, easily carried and easily obtained and which would produce the necessary heat quickly and economically, to establish safeguards against explosions or other accidents due to ignorance or neglect and to eliminate dirt, noise and visible exhausts. It will be seen that the requirements of boiler and fuel are overlapping and inter-dependent.

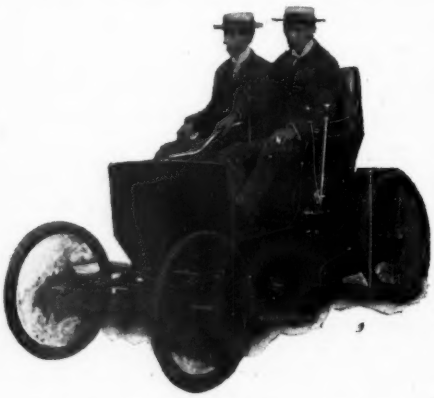
Usual Type Available

The ordinary type of steam engine could be made to conform to the necessary requirements by overcoming difficulties which are merely mechanical, although by no means simple. The task of finding a suitable fuel was not difficult. Ordinary kerosene and its first cousin, stove gasoline, are both cheap and plentiful. They can be obtained at any village store. Other cheap and effective fuels have also been successfully used, but the consideration of the ones named will suffice for the purpose of the present article. The more difficult problem of consuming them in the manner that would give the greatest results for the least expenditure of fuel and at the same time avoid the disadvantages of noisy combustion and nauseous odors was not so simple. The difficulties have, however, been largely overcome, if not entirely. The industry is still so young as to make it possible to speak with absolute authority.

In the construction of the boiler itself, the difficulties were all mechanical, but more difficult of solution than those attendant on the consumption of fuel. Still it is safe to say that they have been largely overcome by a limited few of the makers of steam carriages, if not completely. Again it is difficult to speak authoratitively.

Advantages of Steam

The advantages that are claimed for the steam vehicle, advantages that have been proven to exist in several instances, are light weight, ability to traverse all sorts of streets, roads and grades, high speed, ease of control, large area of travel without replenishing fuel, the ease with which fuel and water may be obtained



Marsh Wagon—American steam vehicle.

and the short time in which these necessities may be placed in the tanks for their reception and the journey resumed.

The disadvantages arise largely from possible or actual failure of the integral parts of the vehicle to perform their functions, owing to the limited experience to which they have been put in actual use.

While no new principles of producing energy have been utilized in either the electric or steam carriage, the electric has followed, of necessity, very closely the lines that have been tried and proven, both as to advantages and disadvantages, to which enough space was surely devoted, while the builder of steam car-

Whitney Carriage—American steam vehicle.

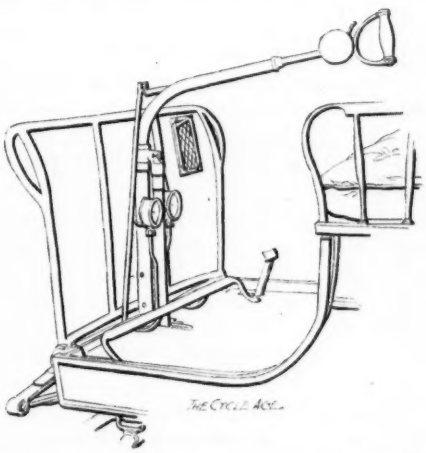
riages has been forced to depart very widely from the accepted and tried methods. A moment's thought will make the reader understand that the generally known types of steam engines have been constructed for use in which weight was not a prime factor. Weight, per se, is, of course, no drawback in a stationary engine, such, for instance as is used to drive the dynamo from which storage batteries derive their power, while, for boats and railroad locomotives it is a factor which enters into consideration to only a limited degree. In the automobile every pound of weight must be considered and hence construction has been lightened to the extreme point.

Automatic Control

To follow the question of departing from accepted lines of construction, almost all steam engines are under the management of a regular engineer, usually one who is licensed after demonstrating that he has the requisite knowledge and ability to enable him to manage an engine without accident. To construct the boiler so that it would require but little attention and perform automatically the acts usually performed by a licensed engineer, was no easy problem, but it has been accomplished. Whether it has been accomplished in such a satisfactory manner that the automatic devices may be depended upon to do their work with never a slip, time alone can tell. The manufacturers of steam carriages claim everything in the way of automatic control and their claims appear to be substantiated by the public tests to which their vehicles have been put. Tested by time and the ignorance of users who have no knowledge of matters mechanical, they may prove that they have defects. It may be safely asserted, however, that these defects will be overcome within a comparatively short time if they have not already been overcome.

Getting Up Steam

It will be readily understood that no vehicle that depends upon steam to drive it, can be started without some delay in order to generate that steam. Steam carriages have, however, been built in which the generation of enough steam to start could be accomplished in much less than ten minutes, sometimes in five. This is, of course, in the best types. A five or ten minute delay is not a great drawback, being no more time than is



Controlling Lever—Device for starting, stopping, regulating speed and reversing Whitney steam carriage. Foot brake is shown at the right.

required to hitch up a horse. In the best specimens of this type, once steam is gotten up, the vehicle may be left standing with practically no consumption of water and only a small consumption of gasoline or kerosene, so that the delay

for getting up steam is met only at the beginning of the journey.

About Odor and Dirt

The element of danger is eliminated by the mechanical regulating devices, except when replenishing the fuel supply. The dangers arising from the use of gasoline have been greatly exaggerated and are entirely eliminated by a little care in the observation of the simplest rules.

A steam engine, with its attendant fuel of gasoline or kerosene, can not be operated without some odor escaping, although such odors have been reduced to the minimum and are so slight that they are not noticeable by the occupants of the vehicle when it is in motion, affecting rather the yokel by the roadside. Neither can the vehicle be operated without some dirt accumulating above that which falls to the lot of the electric. The amount that must be contended with varies in different makes of vehicles. In the best steam carriages, the noise of the exhaust has been so muffled that it can not be heard fifty feet away and in no wise compares in amount to the clatter of a horse's hoofs, and the visible amount of exhaust steam could be covered by a fair sized pocket handkerchief.

Many Certain Advantages

The advantages of the steam carriage, about which there can be no possible question, are moderate first cost, cheap operating expenses, ease of control, light weight, unlimited area of travel, short time in which fuel and water can be replenished and the journey renewed, and the long distance which one supply of fuel will carry the vehicle. To reduce the enumeration of some of these advantages to approximate figures, it may be said that vehicles of this class, built to carry two persons, sell as low as $600.00, can be operated at an expense of less than half of a cent per mile, weigh below 400 pounds, in some cases, and never exceed a moderate maximum, can be supplied with fuel and water in ten minutes and can travel in excess of 100 miles with one supply of fuel, and thirty-five miles without renewing the water.

Degrees of Progress

What has been said in regard to the advantages of these vehicles is no exaggeration, but rather an underestimate as far as it applies to the best examples. Different constructors, however, have arrived at varying degrees of progress and care must, of necessity, be exercised in purchasing, to avoid the expense of footing the cost of some experimental vehicle. There is a vastly greater divergence between the best and the worst steam carriage than between the best and the worst electric.

(This article will be continued in the next issue with a description of gasoline propelled vehicles, including a brief explanation of the principles of the gas engine.)

CRITICISMS WORTH HEEDING

The motor-vehicle, like all things new, is subject to comment and criticism of all kinds and descriptions. Until it becomes an accepted part of the daily life of so large a proportion of the populace as to be considered an indispensable fixture, it will be subject to this general criticism. Every accident that happens will be chronicled by the nearest newspaper and the account will be copied ad libitum. Statistics are being and will be gathered tending to show that the auto is a vicious and uncontrollable nuisance.

An old lady who had never seen a football game, but who had read an account of the total number of casualties attendant on the game for a year, in all parts of the country, asked her son one day how he could get any enjoyment from witnessing the game, when he expected every minute to see someone killed or maimed for life. His reply that he had

witnessed scores of games and had never seen a single player seriously injured did not seem to satisfy the old lady that football was not another name for lawful massacre.

The same method of reasoning convinces the unthinking that the motor-vehicle is a mechanical murderer. Despite the singling out of isolated cases for wholesale criticism, the auto will make its way to the fore—and not over the bodies of mangled victims. However, its progress will be more rapid if the users of the vehicles remember that their every act will be watched by critical eyes, that their slightest accident will be seized upon as a legitimate text for sermons against the auto, and will be magnified and distorted, and, remembering this, will keep careful guard over themselves.

In Paris, where the auto is most numerous, criticisms of reckless driving are manifold. From London come complaints. New York and Chicago furnish their quota of tales of woe, and from other points in the country come cries of protest. Some of them are, doubtless, made without reason, but others come accompanied by ample justification.

The Chicago Journal voices the general sentiment, editorially, as follows:

"The best way to lose a privilege is to abuse it. If drivers of automobiles are to be allowed the free use of the streets they will have to be more considerate of others' rights and more observant of the rules of the road than some of them are at present. Otherwise there is danger of a public demand for their suppression.

"Drivers of other vehicles usually know what they are about, and in general they are more than willing to be governed by regulations that have been found by experience to insure mutual safety. The same can not be said of a good percentage of the drivers of horseless carriages, especially some of the drivers of the livery rigs. They violate the rules of the road at pleasure, cutting in on nervous horses, running at illegal speed, twisting around corners on the wrong side of the road, even venturing collisions, secure in the knowledge that their vehicles weigh tons and can ride down anything that won't get out of the way. They are not trained coachmen. They are engineers, and seem to think the streets are all theirs. At the opera or theater entrances they push in out of their order, making all sorts of confusion, and riding roughshod over the rights of other drivers and of the owners of other vehicles.

"We believe that Chicago generally hailed the advent of the horseless carriage with a good deal of rejoicing. The people wanted it. But we doubt if they want it driven over them or over their rights in the public streets, and the warmth of their welcome is going to be a good deal cooled unless automobile owners exercise more care.

"It ought to be to their interest to do so. They are trying to make their vehicles popular. Manufacturers are trying to sell them, and the livery company to rent them, but if they are to be driven by rough and reckless persons, knowing little and caring less about other drivers' rights, the growth of their popularity will be pretty slow.

"If automobiles are to be run like traction engines, they ought to be treated like traction engines—kept off the streets. If their owners intend to use the streets they should be compelled to conform to the rules that other people who use the streets have to keep. The fact that they are an interesting novelty doesn't give them any more rights than other vehicles.

MOTOR RACING ABROAD

AN ENTHUSIAST THINKS THAT AN APPETITE FOR MOTOR RACING WILL GIVE ENGLAND EXCLUSIVE ROADS FOR AUTOS AND CYCLES—IDEAS OF A MOTOR RACING MAN—FIGURES OF FAST TIMES MADE IN MOTOR RACES

Under the caption "Motor-Car Racing, a Racing Man's Views," the Hon. John Scott Montagu, M. P., discusses, in the Motor-Car World, the question of auto racing in England and the possibility of a craving for the sport, resulting in a system of improved roads in that country. The Hon. John, M. P., is entertaining, even if over sanguine and fanciful in his argument, and what follows contains suggestions which are not so utterly impossible as they appear on their face:

A Fanciful Prediction

Motor-car racing is a new sport, but I feel convinced that when it is realized what a grand sport it is, there will be as many devotees as there are of the many other forms of sport in which the Anglo-Saxon race is pre-eminent.

It is difficult to compare the sensation of motor racing to anything existent, but the nearest analogy is that of a mixture of locomotive driving and steeplechasing. Speeds are now attained on the road approximately near railway speeds, but the unevenness of road, corners and varying gradients all require skill, nerve and coolness such as steeplechasing demands.

At present France is the only country in which motor-car racing can be practiced to any extent, owing to the excellent roads and the friendly attitude of the authorities, a pleasant contfast with the bad surface of most of our English roads and the petty persecutions of petty local authorities. But in the course of time I have no doubt that many of the disabilities under which motorcarists suffer in England will be removed; and, as the various public bodies become more enlightened on the subject of motor-cars, we may expect to see a gradual change for the good in this direction.

Easy of Control

The public do not yet realize that the motor-car is much more easily controlled than the horse-draw vehicle. There is only one brain to initiate, to guide, or to stop the movement of the machine, instead of the man's brain communicating by means of the reins with the horse's brain, the horse's brain then acting on the horse's body to stop or start the vehicle behind him. The brakes, also, of motor vehicles are much more powerful, and the distance in which such vehicles can be turned and maneuvered is much less, the horse, of course, in most cases being almost the same length as the vehicle which it draws.

Then again, in country work there is no shying at night at puddles or new gravel on the road, or plunging in the daytime at pieces of paper or at leaves, as many horses do even in the hands of skilful and experienced drivers. Having been an owner of a good many horses for a number of years, I speak with no animus against the horse, but the motor-car as a means of swift conveyance must eventually predominate. But all the same the horse is a noble animal, and must always be necessary for cross-country work, and, for many years to come, for agricultural purposes; but for fast locomotion between stations and surrounding districts, or for any long journeys, the motor-car must, and will very quickly, supersede the more ancient method of locomotion.

Marvelous Speeds

But to come back to motor-car racing. It is not generally realized in this country what speeds have already actually been achieved on the road. The average of the winner of the Paris-Ostend race was 33½ miles an hour, and in the Paris-Boulogne race the fastest time again was 34½ miles an hour. Even the tourist cars, such as the one I own and race myself, have averaged for the same distance (200 miles) over twenty-four miles an hour carrying four people and the necessarily heavy touring body; my own car, as a matter of fact, averaging 29½ miles an hour between Paris and Amiens, a distance of about eighty miles of rather hilly country, and 30.3 on the comparatively flat road in Belgium between Dunkerque and Ostend. These are "averages," and, of course, on the level or slightly down hill portions of the road speeds between forty and fifty miles an hour are constantly maintained for miles at a time.

The speed through the air, the delightful sensation of power, and the invigorating effect on the nerves in having to control a powerful vehicle running at these high velocities, can only be appreciated by those who have enjoyed the experience.

Favors Motor Roads

I am inclined to think that before long we shall see a movement in favor of motor roads, and that, as a start, London to Brighton might be suggested as the road likely to be most used. Such a road ought

not to cost more than £1,000 a mile at the outside, and if one comes to look at the number of cyclists and motorcarists it is not difficult to see how such a scheme might be financed. Given that 200,000 cyclists at £1 a year, and 10,000 motorcarists at £5 a year would join a road association, this would give an income of £250,000 a year, which would pay interest at 5 per cent. on five millions of money. But we will say for the sake of argument that only £4,000,000 is raised, and that a sinking fund of £150,000 a year is set aside to redeem the original capital. One million would build 1,000 miles of road in various parts of Great Britain, and 1,000 miles of road would reach nearly all the big centers of population, which would then be brought into close touch with the metropolis. To take a few notable instances:

	Miles.
The Great North Road, London to York, say	200
The Oxford Road, say.....	60
The Bath Road—to Bath—say.....	75
The Southampton main road, say.....	75
The Portsmouth Road, say.....	75
The Brighton Road, say	50
The Dover Road, say	75
The Norwich Road, say.....	120
Making a total of.....	765

which might be constructed during the next few years. These roads would have the advantage of relieving the ordinary roads of the country of the fast cycles and motorcars. The up-side and down-side of the road would, of course, be distinct, and on these tracks speeds quite comparable to the fast trains of this country might be attained by well appointed and skilfully managed cars. This idea is certainly worth the consideration of the motor-car and the cyclist world. Without some scheme of this sort I fear that it is useless to hope for road racing in England, where people are so essentially conservative and apathetic regarding new movements. The crowded state of our thoroughfares, also, will, so far as I can see, always be a great impediment to fast speeds, even if legislative restrictions were removed—a very unlikely contingency.

Racing Machines

In this connection, some other notes, gleaned from the same source, are of interest. S. F. Edge, an erstwhile crackajack long-distance cyclist, tells of racing machines that are being built for himself and two of his associates which are to be fitted with four-cylinder gasoline engines of twenty horse-power. They are to be geared to a maximum speed of fifty-five miles an hour and are provided with four changes of toothed speed gearing and with chains from the differential gear to the back wheel axle. The tires of the vehicles are to be nearly five inches in diameter; the front wheels are thirty-three inches and the rear thirty-eight.

Hopes for High Speed

"I am hoping," said Mr. Edge, "to do about forty miles an hour as an average. I am going over to France for the Paris-Bordeaux race in May, and I may mention that if any English rider likes to enter for the Bordeaux-Paris cycle race I shall be very pleased to pace him back to Paris. Then I shall leave my car over in France, and enter for all the big races, including the Paris-St. Petersburg, if that event comes off."

In answer to a question as to the possibility of handling motor-tricycles on tracks at the rate of forty miles an hour or more, Mr. Edge said:

Racing on Tracks

"As to that, the position is like this: There is plenty of scope for skill in manipulating a machine and care in keeping it in order; but the chief element in speed is size of engine. With a large enough engine there is hardly any limit to the speed attainable. But my idea is that this competition of mere horse-power should give place to a system of classification according to the engine's dimensions; just the same as in yacht racing an allowance is made for size. It will then become a competition of skill in perfecting the motor and the whole machine, so as to get the best results from a given size of engine."

Speeds of Motor-Cars

Again drawing from the same paper, we quote some figures for the average speeds made by the winning vehicles in some of the French races of this season. In considering these speeds it will be well to bear in mind that one kilometer is equivalent to about five-eighths of a mile. The following will show that it requires "nerve" as well as skill and a well built vehicle provided with a powerful motor to win a French "course":

In "Le Tour de France," De Knyff, on a 16-horse-power Panhard, averaged fifty-one kilometers per hour over a route of 2,291 kilometers. Paris-Saint Malo was won by Antony, driving a 16-horse-power Mors car, at an average speed of fifty kilometers per hour for the course of 372 kilometers. The same "chauffeur" gained the Paris-Trouville race,

making an average speed of fifty-eight kilometers per hour; distance, 175 kilometers. Levegh (Mors) and Girardot (Panhard), who made a dead heat in the Paris-Ostend race (distance 322 kilometers), averaged fifty-two kilometers to the hour. The 230 kilometers between Paris and Boulogne were covered by Girardot at an average speed of nearly fifty-four kilometers per hour in the race contested on September 17.

Speeds of Motor-Cycles

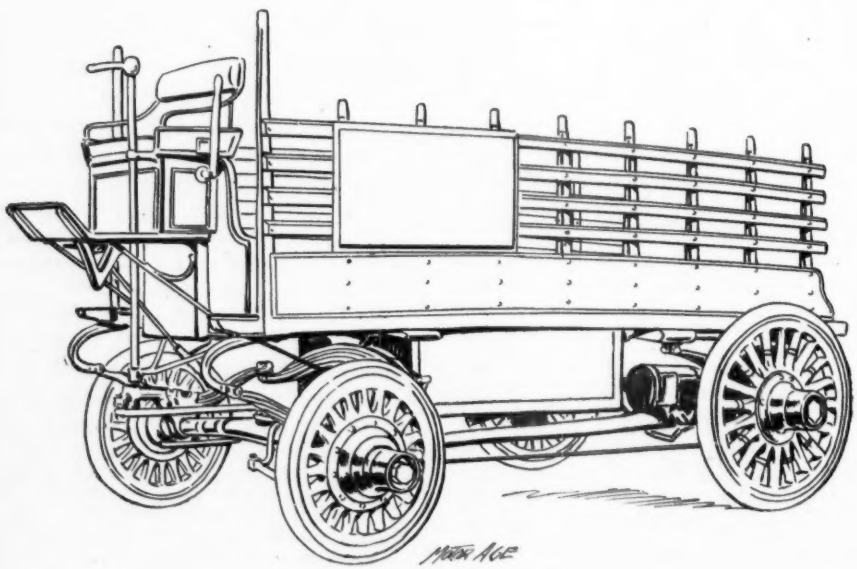
So much for the speed of motor-carriages. There is a difference between them and motor-cycles. The latter, used in racing, are mostly tricycles. The following list of performances for these diminutive vehicles is nothing short of marvelous:

In this year's race over the classic "course," Paris-Bordeaux, Bardin's average time for the 565 kilometers was 42¼ kilometers per hour. Teste, the winner of the greatest race of the year, "Le Tour de France," made an average speed of 41½ kilometers per hour, the distance traversed being 2,291 kilometers. Paris-Saint Malo was won by Renaux on the new horizontal motor bearing his name, and his time for the 372 kilometers gave the high average of fifty-two kilometers per hour. The winner of the Paris-Dieppe race averaged forty-two kilometers per hour, and Teste came out on top in the Paris-Trouville "course" of 175 kilometers, making fifty-seven kilometers per hour.

Baras scored three brilliant victories in the Paris-Lille (258½ kilometers), Paris-Ostend (332 kilometers), and Paris-Boulogne (230 kilometers) races, his respective average times being 48½, 52½ and 45¾ kilometers per hour. This last figure was exceptionally good, as it was made on a quadricycle, carrying a passenger in addition to the intrepid "chauffeur." The last of the big races, Bordeaux-Biarritz, was productive of high averages in each category, and Bertin, the motor cyclist, was no exception, as his time for the 281 kilometers gave the respectable average of sixty kilometers per hour.

Speed Against Time

In dealing with speeds achieved by motor cyclists during this season, mention must be made of Beconnais' wonderful performance at Acheres in September. On the famous "route du Parc d'Agricole," this "chauffeur" covered two kilometers in 1 minute 50 3-5 seconds and made the kilometer with flying start in the remarkable time of 48 seconds, equaling a speed of seventy-five kilometers (forty-seven miles) per hour. This performance, coupled with his recent hour's record on the track, of forty-two miles 337 yards, should go far to compensate Beconnais for his comparative lack of success in the more important road races this year. At the moment he is riding undoubtedly the fastest motor cycle in use in any part of the world, and records come from him with pleasing regularity. Indeed, one is almost afraid to quote the above, as hardly a week passes without new figures being set up for one or other of the recognized distances.



RIKER ELECTRIC TRUCK.

RASHNESS IN GETTING PATENTS

A DEMAND FOR ANY MECHANICAL DEVICE FOLLOWED BY A RUSH OF APPLICATION FOR PATENTS FROM WOULD-BE INVENTORS WHO SPEND TIME AND MONEY WITHOUT SUFFICIENT CAUSE—ENCOURAGED BY UNSCRUPULOUS PATENT ATTORNEYS

It is not the policy of the Motor Age to make note of all the motor-vehicle patents that are issued. All the patents are received and are all carefully scrutinized within less than a week after being issued. Only such as are of some possible merit are mentioned at any length. Occasionally a patent that is manifestly of no value is noted and its defects pointed out briefly.

A reader, puzzled by the apparently large proportion of patents that might prove of some value, questions as to whether all patents are commented upon, and, if not, why an occasional valueless one is picked out for mention and others passed by. There is occasional mention of a patent, which, by no possibility, can ever prove of value, and such mention is made as an object lesson to prospective inventors with the hope of discouraging a useless waste of brain matter and money. More deplorable than the palpably impractical patents that are issued, however, are those which involve the exercise of clever mechanical ingenuity and careful thought, but which are of no practical value for any one of the reasons outlined hereafter.

Patents Follow Demand

As often as any general demand arises for articles requiring mechanical ingenuity in their make-up or in the machinery required to manufacture them, just so often is the patent office flooded with applications for patents. The greater the demand, the more newspaper publicity given to that demand and the greater the prospective profit to be derived from good patents, the greater the number of applications. Long as the bicycle has been on the market in form approaching perfection, the patent office is still flooded with applications for bicycle patents and every week it turns out a goodly grist.

The auto has, for some time, been rivaling the bicycle in the number of applications to which it has given rise, and the number is constantly increasing.

Object of a Patent

The object of a patent is, primarily, to protect the inventor in the exclusive use of his invention or to give him a lever whereby he can levy toll on all who desire to avail themselves of the results of his ingenuity—which amounts to much the same thing. There are manufacturing concerns who follow a policy of endeavoring to get patents on each and every device which smacks of novelty which they add to their products, for the purpose of discouraging imitation and keeping others out of the field. Often they go so far as to get patents on devices which are inferior to the ones which they are using, but with the same reason. When this is the object, what may be aptly called "promiscuous patenting" is excusable. Where there is no such object, and where the invention, though it be an invention of ingenuity and merit, is of little or no commercial value, the expenditure of time and money in obtaining patents is the sheerest kind of folly.

A Poor Inspiration

A recent caller at the Motor Age office desired to know if the paper had commented on a certain patent, recently issued, which he named. To the embarrassment of the caller he was shown the page where the patent had been noted and in no favorable terms. In a brief discussion with the editor he stated that he had conceived an idea for performing the same functions in an auto in a different manner than the one utilized by a successful manufacturer and he had gotten it patented. He thought the patent ought to be valuable, and he still thinks so—for inventors are not easily persuad-

ed that their inventions are not valuable.

In outlining the motive that induced him to spend his time and money in securing a patent, however, he furnished a text on which many score of sermons might be preached to the profit of the average inventor—if he would but listen.

Consider Utility

Before spending time and money on mechanical novelties, the would-be inventor should first ask himself of what practical utility his invention will prove, even if he carries it to the point of excellence for which he hopes.

If he satisfies himself that the invention is practical and useful, he should then consider the question of the quality of patent he may be able to obtain. The word "quality" is used advisedly, for there are qualities in patents. Occasionally one comes across a patent so broad that, provided it stands the test of a legal fight, it will shut out all others. The very, very large per cent, however—much more than ninety-nine — protect the inventor only in one particular method of accomplishing a given result when there may be fifty other methods, some of which are as good or better. Such a patent is of little commercial value and there is no fortune to be made from it.

Money and Business Ability

When these two points are satisfactorily settled, the inventor should ask himself if, after the patent is granted, he has the business ability and the money to make it a commercial success, or can get them. The need of business ability and money is as often overlooked as the need of originality and practicability. Unless a patent is so broad that it practically puts an end to opposition, it is of little value, unless it has the backing of good business ability and plenty of money.

Patent Values

In discussing the value of patents with a patent attorney of national reputation, the writer asked him what the value of the average patent was. The attorney replied that the average patent was not worth anything, and that even good patents were of little value except when carefully manipulated.

"To make a good patent valuable," he said, "money and business acumen are both necessary. To accomplish success, from a business standpoint, I would value the patent at ten per cent of the whole, the business acumen at forty per cent and the capital at fifty per cent. That is a patent attorney's opinion."

This was the statement of a man who does not encourage his clients to take out worthless patents. If all patent attorneys were like him, inventors would be saved a deal of money, time and trouble. The world, however, is not entirely made up of honest men. An inventor calls on a patent attorney, and, if he has the necessary money to pay for the preliminary fee and for the services of the attorney, it is to the latter's financial advantage to encourage the inventor in the idea that he has a valuable invention, and, whether he has or not, to get a patent on any possible grounds.

Worthless Patents

It is not a difficult matter for an attorney to get a patent on almost any ingenious mechanical device, by giving sufficient latitude to the wording of the claims on which, alone, the value of the patent hinges. In a patent that recently came to the Motor Age office the entire ground for allowing the first claim of the patent lies in the fact that a complicated train of mechanism is lubricated by means of holes in the centers of the various shafts employed. As far as this claim goes, it can be dodged by effecting the lubrication in any other manner. There are other claims allowed on the patent, but they are all as flimsy as this one, and the patent could be circumvented in a hundred different ways if it were worth the trouble to try.

Wasted Money

There are thousands of patent attorneys who will get patents which are as worthless as the one cited and take their clients' money for doing so. If this were the end of the matter it would not be so bad, but attorneys of this class stir up hopes that are baseless in the minds of men who had far better be spending their time earning a living in fields where they are capable of doing so, instead of chasing rainbows.

There are cases—not a few, but a great

many—of men who have spent their best years in the elusive pursuit of patents that they have vainly hoped would bring them fortunes, only to be disappointed time after time. It seems a mania with some; some have the good sense to stop the usually fruitless pursuit after one or two rebuffs; a very, very few realize their hopes, in part.

It may safely be said that there is not one patent in a hundred that is worth the time and labor and worry that is expended on it. Not only are the patents themselves of little or no value, as a rule, but, of those which have real merit, there are very few that ever bring much in the way of financial returns to inventors.

It is next to useless to talk to inventors about this matter, but, if what has been said results in saving one man the anxiety incident to seeing time, money and fond hopes vanish into mist, it will have accomplished a purpose justifying its publication.

ECONOMY OF FUEL

There is one feature in the construction of gasoline motors which seems to have received but scant attention from the majority of builders, and which, where it has been taken up, has been worked out on many different theories with varying success. This is the supplying of fuel sufficient to do the work required and no more, bringing it to the point where it may be measured automatically, according to the amount of work being done by the motor.

To accomplish this result many ideas have been worked out, but in a large number of instances the apparent theory has been, that a saving in fuel was attained by cutting down the speed of the motor where it became desirable to reduce the speed of the vehicle, a method which, for obvious reasons, is undesirable.

A method frequently employed is the hit-and-miss governor principle in one of its many forms, but this is not as economical in practice as would appear from a casual study.

From experiments already made and others that have reached a stage sufficiently advanced to allow of their use as accurate sources of knowledge, it has been determined that to secure true economy of fuel, clean combustion and practically no vibration, the fuel supply should be at all times regulated according to the amount of work actually being done, not according to the speed which it is intended to maintain. In other words the constructor should grade his charge to the load; he should have his mechanism so arranged that while the motor would maintain a certain speed at all times, the charges of fuel would be either reduced or increased, or maintained at a given measure according to the demands made upon the motor for a greater or less power, as in ascending or descending grades.

In the method under consideration the consumption is regulated in an entirely automatical manner, and, after it has been determined what quantity of fuel is required to give the engine a little less than its greatest efficiency, the apparatus needs no further attention, except as to being kept in a cleanly condition.

In connection with this method of regulating the supply of fuel it has been found advisable to reduce the size of the carburetar to a point which allows of little more than enough volume to carry one full charge for the motor when running at its highest efficiency. Furthermore the air supply is fixed for all times and the grading of the charge is made by the variable action of an injector, this having been found more reliable than other means whereby the vapor is drawn direct from the oil reservoir and the density of the charge regulated by the action of the air valves, or where fuel is fed by gravity.

The injector in combination with the small vaporizer forms the soul of the economical feature of such an apparatus. It has proved its superiority over other forms in use, though there may be other

devices, unknown to the writer, differently constructed, yet accomplishing the same end. If there are, however, they have been kept well in the background by their inventors and will only see the light of day in combination with some particular make of vehicle.

Details of most intrinsic value the advent of which mark pronounced advances in the state of an art, are too often the ones which are longest kept from public gaze.

Improvements in line with the one herein mentioned tend toward placing the internal explosion motor on a higher plane of usefulness and on a more even footing with the steam engine as a prime-mover. It not only tends to a more highly efficient motor from an economical point of view but assists in bringing it closer to that standard of simplicity which science recognizes as the goal of inventive genius, founded upon sound mechanical laws and principles.

STORAGE BATTERY PROBLEM

The following statement of the storage batteries problem, taken from the Electrical Review is interesting in connection with what was said in the Motor Age recently about the "Evolution of the Accumulator" and may be read with advantage by all who are interested in electric automobiles:

The motor car movement has greatly stimulated the efforts of inventors to produce a storage battery of great capacity per unit of weight, and not a few batteries have been put on the market professing to be of much less weight for equal output than the older forms. An examination of these new batteries and of the specifications reveals the fact that the inventors have not succeeded in making any departure from the essentials of the Faure and Plante cells, lead and lead salts alone being successfully used. The plates consist of lead salts held in or upon a lead grit or electrode.

In stationary batteries there are no objections to constructing the grids substantially enough to perform the two functions of supporting the active materials and collecting the current therefrom, thus producing cells of considerable weight, six or seven watt-hours per pound weight of battery being a fair result in capacity. Such batteries are well understood and are durable and reliable, but for successful traction work batteries of such weight are not suitable.

Most inventors endeavor to reduce the weight by increasing the proportion of lead salts to the weight of the grid; in heavy batteries we may find the lead grid equal to twice the weight of lead salts used in making up the plates, while in some recent cells we find it claimed that the grid is only half the weight of the salts.

So long as lead is used in batteries, the only invention possible is in the direction of reducing the mass of lead in the cell, sufficient being left simply to collect the current. The supporting of the active materials being no longer trusted to the grid, the inventor then devised supports of ebonite, glass, acid-proof paper and other materials, much lighter than lead, which are applied in two different ways.

One uses a grid of vertical lead wires threaded through horizontal strips of ebonite, forming shelves, which carry the active materials and support them. Another takes glass rods as a weft interwoven with lead wires, the glass giving stiffness and resilience to the plates. A third employs very light perforated grids, and supports them by plates of light acid-proof paper, also perforated. Others prefer envelopes of celluloid or ebonite to hold the paste on extremely thin grids.

In all this there is not much invention. Still, if by some means a battery of great capacity and small weight can be produced, it is worthy of a patent.

It is claimed for some of these cells that fifteen to sixteen watt-hours per pound of battery, at a discharge rate of one ampere per pound of battery, has been obtained. We have failed, however, to find any independent confirmation of a capacity in any battery exceeding ten to eleven watt-hours per pound. We are convinced that all these high capacity light weight cells will require very frequent renewal of plates; the negatives rapidly decline in capacity in continuous work, and the positive grids soon corrode right through, the internal resistance increasing as these changes go on.

The renewal of cheap plates as soon as the capacity falls below a certain amount should be provided for in all battery traction projects, renewals forming a large part of the cost of battery traction. Plates which were expensive to renew would be no improvement over cheap plates of the same capacity.

In judging traction batteries it is not,

therefore, sufficient to find the capacity per pound weight only. It is necessary to find how long that capacity is maintained in continuous working. Say, a battery starts with a capacity of two watt-hours per pound, how many full charges and discharges will it stand before the capacity falls to ten watt-hours per pound, and what will be the cost of renewal? These questions are rarely answered in descriptions of new cells.

In connection with road traction by batteries, we find that most vehicles for that purpose carry eighty-volt batteries. Why eighty volts? We have never been able to find out the reason for this singular voltage, why not use larger cells and fewer of them?

The battery is so near the motor that loss in the leads is negligible. As only 100 to 120-volt circuits can be used for charging eighty-volt batteries, probably eighty volts was selected in the days when 110 volts was the usual pressure; but nowadays 200 to 250 is becoming so common that batteries to be used on supply from street mains must be raised to 160, 180, or 200 volts pressure, although small cells do not give quite as high a capacity per pound as larger ones.

On the whole, inventors have not much room for improvements in lead cells. When they have reduced the grid to a minimum, and supported the active materials by something lighter than lead, their efforts are exhausted, and a possible capacity of about fourteen watt-hours per pound is obtained for a time.

AUTOMOBILES IN SHANGHAI

In response to an inquiry from a motor vehicle firm in Chicago, Consul General Goodnow writes from Shanghai as follows:

I would advise that catalogues and dealers' net prices be sent to the following American firms in Shanghai: American Trading Company, Mustard & Co., Dunning & Co., China and Japan Trading Company; Fearon, Daniel & Co.; Wisner & Co., Frazar & Co. and A. W. Danforth. It will probably be found feasible, after correspondence. to make one of these firms an exclusive agent.

This is an ideal place for motor vehicles. The town, built on alluvial deposit in the mouth of the Yangtze river, is level. The roads are macadamized, and the climate is such, especially in summer, that everybody drives. The horses are small, about the size and character of our Indian ponies. The foreigners are comparatively few (say 5,000 men, women and children); but there are nearly 500,000 Chinese in the settlements, and these take very kindly to our mechanical inventions as soon as they see them. Shanghai, also, is the distributing point for central and northern China. The merchants from the other treaty ports come here to buy their goods. Arrangements should be made to show vehicles, and to make a practical everyday demonstration of their ease of management and durability.

The Chinese will not buy goods without having seen them. The average Chinese has seen so few new things that it is not easy for him to exert his imagination. Foreigners here are also slow to buy motor vehicles. The prices are considered high, and many think of the vehicles as experimental playthings. Neither the foreigners nor the Chinese can be induced to buy by descriptions or catalogues. There have been one or two auto motors shown here, but they were of an inferior type and manifestly unfit for either use or pleasure.

This is the best time to push this trade in Shanghai, as there are no street railways here and the city is growing so rapidly that need is felt for more rapid transit.

There are two ways to advertise these new vehicles. One is to send a machine to some person well known here, who will use it constantly, demonstrating the fact that it can be used by an amateur for pleasure at a cheap running cost. I am inclined to think myself that this would be the better plan. It must be remembered that the cost of transportation in Shanghai differs from that in Chicago. Here a carriage with two horses, driver and footman can be hired for $75 Mexican (say, $36 gold) per month. Or if one owns ponies they can be fed for $6 Mexican per month, and the driver and footman can be hired for $17 Mexican (for the two) per month. It would be necessary, under this plan, to practically give the use of a vehicle to some well-known person who would use the same constantly and keep it in repair. It may be possible that a like result would be reached by placing the vehicles on exhibition with one of the above-named firms; but if it is desired to get a part of the Chinese trade—which is immense and is thoroughly interested in American mechanical inventions—I would strongly urge that one or more machines be shown on the streets here, in such a manner that the Chinese will know that they are used by Americans of a position that will guarantee their desirability as vehicles of use, pleasure and fashion.

SUITING THE PUBLIC TASTE

CONSTRUCTORS HAVE A DIFFICULT PROBLEM IN DECIDING JUST HOW MUCH HEED TO GIVE TO ESTABLISHED STYLES AND HOW MUCH TO PRACTICAL UTILITY—THE PUBLIC WANTS VEHICLES WHICH CONFORM TO PRESENT STYLES OF CONSTRUCTION AND ARE, AT THE SAME TIME, THOROUGHLY PRACTICAL

One maxim which those who manufacture goods for the public always heed, if they expect to be successful, is to "give the people what they want." This maxim applies to the manufacture of motor-vehicles as much as to anything else and yet——.

It is sometimes difficult to determine what the people want. It is natural to believe that they who have been accustomed to riding in horse-drawn carriages all their lives will want auto-carriages that will resemble the ones which they have been using for years. It is particularly natural to come to this conclusion when it is remembered that those who can, at the present time, afford to purchase self-propelled vehicles are the very ones who have demanded that their old style vehicles be up to the latest mode of the old style.

Want Practical Vehicles

It must be remembered, however, that all who purchase autos want vehicles that are practical in every way. It must be remembered that some of the conditions involved in the use of horses have necessitated the styles and methods of construction that mark the vehicle of the end of the nineteenth century. When it is taken into consideration that many of those conditions are not incident to the construction of autos, it will be readily understood that the only reason for following the established lines of carriage building is to conform to the public ideas of what is proper. It is the same principle of reasoning that led the builders of the first railway cars to make them look like stage coaches.

Evolution Will Be Slow

If it were possible to get away from the influence of public opinion, it would not be long before automobiles would develop the forms and methods that are most suitable to the new regime, but, as public opinion must be considered, this evolution is bound to be a matter of considerable time. The public has its known predisposition to favor that to which it is accustomed, and, in addition, it has an equally certain but less tangible desire for that which is satisfactory in every respect. The question which confronts the auto builder of today is that of determining how much heed he must give to the demand for vehicles which will please the public eye, as it is educated today, and how much he must give to practical utility.

Dissatisfied Customers

If a purchaser finds that his vehicle meets all requirements of the eye and still does not come up to the standard of less attractive looking vehicles, he will be dissatisfied. The builder will not find it good policy for the present, at least, to depart very widely from ordinary carriage construction, and yet he may modify that construction to a degree that will give advantages to his auto without offending the eye of the prospective purchaser.

Some Necessary Changes

Already the tendency is noticeable to make vehicles set closer to the ground. There is no horse to obstruct the view in a low vehicle, and the lower it be the greater its safety when run at high speeds and when rounding corners. With the frame setting lower, it is natural to decrease the size of the wheels themselves which is one of the desirable things in auto construction. There is also a tendency to increase the wheel base to make the steering easier and the method of steering by means of short stud axles enables the constructor to do this without detracting from the appearance of the vehicle or cutting under the body. These are features which apply only to

the construction of parts which are common to both the old and new styles.

More Radical Changes

The desirability of distributing the load somewhere near equally makes it desirable to locate some part of the motor or driving mechanism in the fore part of the carriage. Here common sense and public taste run foul of each other in earnest. To replace the thin dashboard by a box of considerable dimensions seems to the average purchaser the height of absurdity—because he does not and will not stop to reason. He may, however, be induced to buy a carriage that has such a box if it is not too large to be stomached by his fastidious (?) taste. After a few years it will appear to him that the old fashioned vehicles were illy proportioned for the lack of the very box that so offends him today, so much does custom influence men.

A Difficult Problem

It is a delicate matter, that of combining practical utility with the lines that will suit the custom-trained public. It is as bad as the question which confronts the dressmaker whose patron, a fat dowager, wishes a gown that will look the same on her as the "coming out" dress of a lithe debutante. It may be set down as settled that a great many of the constructor's ideas of what is of the best practical utility must be sacrificed to public taste, if he desires to make a commercial success. At the same time he may take it for granted that the public will permit some deviations from that to which it is accustomed. Just how much is uncertain. It is a delicate question.

Must Stay Within Bounds

In confronting the problem, the constructor must make up his own mind how much latitude he is going to allow himself and then stick within his bounds. He may make two or three radical changes without giving too much offense to the eye. They will not make the vehicles, as a whole, utterly different from the accepted styles. But let him go on following one departure with another, indefinitely, and he will have something that the public will refuse to have at any price.

Today we see motor vehicles which can be properly called carriages, and others which may, with equal propriety, be called cycles. Again, we see those which are neither the one nor the other. The carriages will appeal most strongly to those who have been accustomed to the use of carriages and less strongly to those to whom they are a familiar sight, and the same course of reasoning may be applied to the cycles. But the nondescripts—they will appeal to no class that now exists. There may be a wide field for them at some indefinite time in the future, but not now. It may be that three-wheeled carriages are the best from a purely practical standpoint—there are many sound arguments in their favor—but, to use a slang phrase, the public "will not stand for them" at present.

The Purchaser's Problem

So much of the matter from the constructor's standpoint. The purchaser will be met with a not less puzzling, if less momentous, question. He must decide for himself just how much heed he must pay, in making his purchases, to the appearance of the carriage and just how much to utility. The decision in this matter will depend, to a very great extent, on the uses to which the vehicle is to be put and to his own mental make-up. There are some few with whom public opinion cuts little figure. They will get what seems to them most practical. Others will carefully debate the subject, weighing style against utility.

WHERE THEORY OF PROMISE PREVAILS

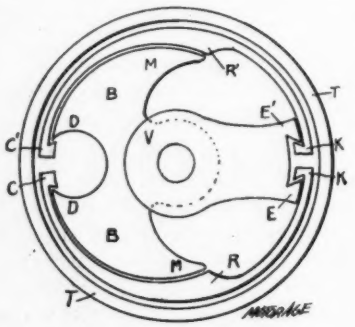
PROBLEMS WORKED OUT

AN INGENIOUS DEVICE TO OVERCOME JIGGERING OF WHEELS—THE EXPANDING PULLEY SHOWN TO BE AN OLD DEVICE—JAMIESON'S NOVEL STEERING GEAR AND THE VEHICLE TO WHICH IT IS ATTACHED

JENTAUD'S CONTROLLING DEVICE

"Whipping" and "jiggering" are recognized as inherent faults of the steering levers of autos and a vast deal of attention has been devoted to the construction of devices to overcome these faults. The device of which a description follows is the invention of a Frenchman, Jeantaud, and is at once ingenious and simple and, in use, has been found effective:

The hand-wheel is attached to the piece, V, which is furnished with two fingers, E and E1, and turns, loose, on the spindle, A. The piece, BB, is keyed on to A, and is provided with two fingers, D and D1. A spring, R, covered with leather and terminated by two hooks, C and K, unites the fingers E and D; another spring, R1, symmetrical to R about XY, unites the fingers E1 and D1 by means of the hooks, C1 and K1. Finally, the whole is enclosed in a drum, T, firmly attached to the fixed sockets in which the spindle, A, turns.

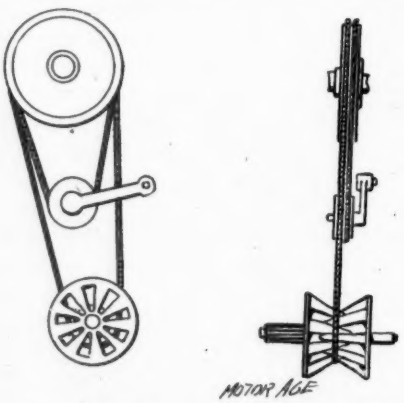


Let us suppose, firstly, that the conductor turns the hand-wheel in the sense of the arrow, F. The piece, V, will turn in the sense F and by the finger, E, will drag the spring, R, which will engage with the piece, B, by the hook, C, and pull it by the finger, D. As B is fixed on the spindle, A, the wheel in this way turns A.

By turning the hand-wheel in the opposite sense the spring, R1, comes into play and connects the hand-wheel and the spindle. Suppose, however, that the spindle tries to turn in the sense of F under the action of the wheels. The fixed piece, B, will turn in the same sense, the portion of it marked M will engage with the spring, R, and owing to the taper of the part of the spring opposite M and the slope on M, the piece, B, will force the spring to expand. In expanding the spring, R, will press against the internal wall of the fixed drum, T, thus acting as an automatic brake to the gear. If A attempts to turn in the opposite direction the spring, R1, will rub the surface of the drum in the same way. In either case the control is irreversible.

A NEW-OLD DEVICE

In trying to solve the problem of varying the speed of motor-carriages having explosive engines to provide motor power, almost every device known to the mechanical world has been tried. Among others is that of the expanding pulley, which was thought to be of comparatively recent invention. The accompanying illustration, which is copied from the Scientific American of December 25, 1858, will show that the device is much older



than was thought. The following is the description as published, copied from the London Engineer of a still earlier date. The invention was that of James

Coombs, a machinist, of Belfast, Ireland, who used a gut band or rope:

"If we suppose two cones made with radial spaces alternating with solid parts, and the one made to slide freely into the corresponding spaces of the other, we shall have a very correct idea of this pulley. The sizes of the radial sections of the cover are so regulated that when the two cones are put together they form a V-shaped pulley, the diameter of which varies according to the position which the cones occupy in regard to each other.

"A very simple method is represented of applying a stretching pulley. The band is passed twice around with the expander in one fold, and the stretching pulley in the other. When two expanding pulleys are used, the one to drive the other, the stretching pulley is not required.

"A round gut band has been used for seventeen months on one of these pulleys, driving a 60-spindle roving frame in a flax factory, and it is nearly as good as when first put on. A pair of these expanding pulleys were employed on a drilling machine at Leeds, and they were capable of being changed from four to sixteen inches in diameter, while the machine was running, thus obtaining a variation of speed from twenty to 320 revolutions per minute, with all the intermediate speeds."

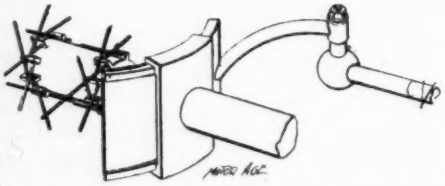
It will be seen, in order to allow for the expanding action lengthwise, that the expanding wheel is provided with a long pinion, or its equivalent, for transmitting or receiving motion.

A NOVEL STEERING DEVICE

The accompanying illustration shows the construction of a steering gear patented by Robert W. Jamieson on Nov.

JAMIESON'S VEHICLE.

14. The cut clearly shows the nature of the device. It consists of two arc shaped members, the circles of which are struck from a center within the wheel hubs. The members are slidably connected. The in-



ventor claims that the device not only turns the wheels upon their vertical axes but is a self locking device, as well, eliminating the tendency of the usual short stud axle to turn upon its connection and cause jiggering of the steering lever.

Mr. Jamieson writes the Motor Age that he has thoroughly tested the device on the steam vehicle of which an illustration is given.

A HISTORIC VEHICLE

The illustration appearing on our front cover represents a historic vehicle. It is the one that finished second in the Marseilles-Paris race in 1896. It later passed into the hands of S. F. Edge, an ex-cycle racer, who put it to many speed tests. He says that it is still faster than six horse-power Panhards of the present day of the same type of body and wheels.

MINOR NEWS AND COMMENT

ENGLISH AUTO SHOWS

The rival National and the Stanley cycle shows, both annual fixtures in London, have just passed, and both contained a number of motor-vehicle exhibits. Some attempt was made to separate the motor vehicles and accessories from the cycles and parts, but seems to have been none too successful. The larger vehicles were, for the most part, by themselves, but the motor-cycles and accessories of all kinds were indiscriminately mixed with the cycle exhibits.

At the National show there were thirty-eight exhibitors of motor-vehicles and motor-vehicle accessories. Of this number twenty-one showed motor-carriages and motor-cycles. At the Stanley show there were fifty-six exhibitors, of whom twenty-seven showed vehicles and cycles. Among the exhibits at the National show a sample of the Stanley trap is exhibited by the English branch of the Locomobile Company of America. There was one German exhibitor and one French, while the others were all English, although there were a number of foreign machines shown by English firms who act in the capacity of agents. At the Stanley show Gormully & Jeffery Mfg. Co., of Chicago, exhibit one motor-tricycle and one non-convertible quad. Aside from this firm all were English except one exhibitor from Belgium.

In each show the exhibits were divided almost equally between what might be properly termed carriages and cycles having two, three or four wheels. There was an almost total absence of trucks or delivery wagons of any description. For the most part the vehicles shown were propelled by gasoline motors, the Stanley and a few electrics being the only exceptions. Many of the exhibits were of experimental vehicles only. In regard to this feature the Autocar says:

"We, of course, can only deal with what is actually shown, but we feel it due to our readers to warn them that in not a few cases where machines are shown by people of no repute who have little or no experience in autocar construction, it is well to be wary. We happen to know that in a good many instances the motor cycle shown is actually the only one which the exhibitor has ever made. It is simply shown as a sort of plummet to gauge public taste and to see how many orders will result from its exposition. If sufficient encouragement be given the ex-

hibitor will commence to experiment on his new customers. He will learn a good deal in a short time, and so will they."

ANENT ROLLER BEARINGS

President Myron Francis Hill, of the American Roller Bearing Co., writes the Motor Age as follows:

An account of a conical roller bearing on page 235 of the issue of November 30 of The Motor Age calls, I think, for one or two suggestions, as the information is somewhat erroneous. It is unnecessary to discuss the Timken roller bearing, as the criticisms in the account are well founded. One or two statements, however, about roller bearings in general, are erroneous. For example, the following statement is made: "As a matter of fact, a roller bearing of this or any other type on the market would run harder under a heavier load if it were not lubricated than a well greased plain bearing." This statement may be true about roller bearings in which there is a rub upon cages, as in the Timken or any other caged roller bearings, but it is certainly not true of the roller bearing which we have put upon the market in which all rubbing is eliminated. An account of one of our early tests of this feature would doubtless interest your readers. We had some small bicycle bearings of the A. R. B. type placed under the load of a 150-pound iron disk. This disk was started for testing purposes at a speed of about 200 revolutions per minute. When tried with commercial ball bearings, well oiled with high grade lubricant, it ran about 30 minutes, and on the A. R. B. with a corresponding lubricant it ran 1 hour and 22 minutes. Then the bearing was thoroughly cleaned with gasoline and started again at the same speed. It ran the same length of time within a few seconds, showing that the lubricant had absolutely no effect whatever upon its running qualities. Of course upon the road a steel bearing will rust under the conditions of moisture experienced, and some lubricant is necessary to prevent this rusting.

Another statement in this article also presents an erroneous idea in mechanics: "Nor is there any provision for overcoming the sliding friction due to the greater diameter of the bearing surfaces of the cups than the bearing surfaces of the cones, in which respect, however, this bearing is not inferior to other roller bearings or to almost all ball bearings." As a matter of fact there is no such sliding friction in any roller or ball bearing. To look at it from a practical point of view, we have at the Philadelphia exposition a 135-pound wheel mounted upon our bearings. A silk handkerchief will turn it. These results could not possibly be obtained if there was the slightest bit of sliding friction in any part of the bearing. This result is secured with a dry bearing.

To look at the question from a theoretical point of view, the action of a roller is determined by its contact with the hub race and the axle race. Without the roller, the races would rub against each other. When a roller is inserted it is driven fast enough by the turning member to roll without sliding or slipping. If the axle race has one-half the circumference of the hub race, it is natural that the roller travels around the hub once while the axle is turning twice. In other words, the roller runs at the right speed to compensate for the difference in the size between the axle and the hub race. In a caged roller bearing the cages are dragged around by these rollers. In the A. R. B. the separators are rolled around at the same rate of speed with the main rollers, thus securing a purely rolling action of the parts. This purely rolling action is secured by mathematical proportions between the parts, and this idea is broadly covered by the patent rights of the American Roller Bearing Co.

NEW DURYEA COMPANY

A dispatch from Peoria states that incorporation papers of the Duryea Motor Company were filed in New Jersey on November 28. The capital stock will be $1,000,000, of which $100,000 will be 6 per cent preferred stock. The company has purchased the patents of the Duryea Mfg. Co., of that city. Henry Crowther, of New York city, is president, and Charles E. Duryea vice-president and chief engineer. All of the stock has been underwritten. The company will erect a large factory in the east in addition to the one in Peoria.

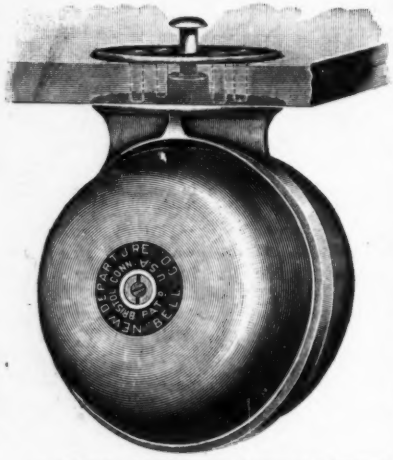
NOTES OF INTEREST

Postmaster Hess, of Indianapolis, has joined the number of postal authorities who are enthusiastic over the subject of the auto for handling the mails. He has been endeavoring to get the Washington authorities to permit him to carry on experiments at the Hoosier capital.

The English Motor Car Club held a run from London to Brighton recently. The distance is fifty-two miles, over good roads. More than 115 automobiles started. They included phaetons, 'buses, cabs, wagonettes and even the 1¾ horse-power tricycle was represented.

The Riker Electric Vehicle Co. has contracted for nine spaces at the New York automobile and cycle show.

NEW DEPARTURE AUTOMOBILE



5-INCH GONG—DOUBLE STROKE

Two gongs, differing in tone. Depressing plunger strikes one gong, releasing it strikes the other, thus producing a chime peculiarly distinct and noticeable—different from any other alarm ever heard.

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